

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



QHD/951  
R73  
Research  
Service

# AREI UPDATES

Updates on Agricultural Resources and Environmental Indicators

Number 17

Dec. 1996

Natural  
Resources and  
Environment  
Division

## Agricultural and Conservation Practices in the Mississippi Embayment

- This study, one of 11 designed to assess the factors that influence farmers' decisions to use resource-conserving farm practices, covered 21 million acres of agricultural land in Mississippi, Tennessee, Arkansas, Missouri, Kentucky, and Louisiana.
- The major agricultural land uses in 1993 for this area were soybeans (35 percent), cotton (22 percent), and pasture (10 percent). Over 30 percent of the agricultural land was irrigated.
- Nearly one-fifth of the agricultural land in this region is highly erodible land (HEL). Almost one-half has either high or very high soil leaching potential for chemicals.

This survey was one of 11 done in various environmentally sensitive areas where agricultural production was important. About one-third of the farmers surveyed were from Mississippi, and nearly one-quarter were from Tennessee. The remainder were from Arkansas, Missouri, Kentucky, and Louisiana. The findings presented here pertain only to the agricultural and resource characteristics of the area.

Over one-third of the agricultural land in this region was planted to soybeans in 1993. Less than 5 percent of the soybean farmers participated in any government farm program. Cotton was the second largest crop in terms of area, and almost 90 percent of cotton farmers participated in farm programs.

Nineteen percent of the agricultural land in this region is highly erodible land (HEL). Of the major crops, corn had the largest share of acres planted on HEL, about 30 percent. Corn also had the highest share of area grown under no-till or other conservation tillage methods, over 40 percent. About 20 percent of the soybean and wheat acres were also grown using no-till or other conservation methods. Less than 5 percent of the agricultural area of this region was in the Conservation Reserve Program (CRP) in 1993. Forty-five percent of the agricultural land in this region is very susceptible to pesticide leaching, i.e., classified as having either high or very high soil leachability.



Over 30 percent of the agricultural land was irrigated, including all the rice area, one-third of the soybean and cotton acres, and one-fourth of the corn and wheat areas. Gravity systems were the predominant technology.

Destruction of crop residues for host-free zones and rotations were the two most prevalent forms of pest management. Professional scouts and chemical dealers were reported by farmers as the most common sources of paid advice about pesticide use.

Over one-third of the corn area was nitrogen tested (either soil or tissue) as a nutrient management practice. Nitrogen testing also occurred on almost 30 percent of the cotton and rice crops. Farmers reported that the most important factor determining nitrogen use was the standard amount for the crop when in a particular rotation.

Authors: Miriam Stuart (202) 501-8365 [mstuart@econ.ag.gov]; Cassandra Klotz; and Catherine Kascak. Graphic: Vince Breneman.

### About AREI UPDATES

AREI UPDATES is a periodic series that supplements and updates information in **Agricultural Resources and Environmental Indicators (AREI)**, USDA, ERS, AH-705, Dec. 1994. **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource use and conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **AREI UPDATES** or **AREI**, contact Richard Magleby, (202) 219-0436. [rmagleby@econ.ag.gov]



# **Agricultural and resource characteristics of the Mississippi Embayment study area, 1993**

Land use	Corn	Cotton	Rice	Soy	Wheat	Other crops	Total crops	CRP	Pasture	Other land*	Total ag. land
Acres in use (1000)	1,111	4,619	1,438	7,395	1,137	961	16,661	1,036	2,136	1,340	21,173
% ag. land in use	5.2	21.8	6.8	34.9	5.4	4.5	78.7	4.9	10.1	6.3	100.0
% area in govt. programs	78.2	89.9	91.5	4.9	73.7	37.8	47.4	100.0	0	n/a	47.0

\*Other agricultural land includes fallow fields, set-aside, building sites, wetlands, wooded areas, and aquaculture.

Conservation practices	Corn	Cotton	Rice	Soybeans	Wheat	CRP	Pasture	All Ag. Land
<i>Percent of acres</i>								
Conservation plan	55.3	56.4	23.8	27.8	30.9	70.0	22.5	38.7
Chiseling and subsoiling	25.5	45.3	6.6	16.7	17.4	0	0	19.8
Conservation cover	10.9	8.9	5.3	6.5	8.3	60.9	4.9	11.1
Cover and green manure crop	1.4	4.2	2.6	1.4	0.2	0	0	1.9
Crop residue use	30.3	22.1	15.1	19.1	22.9	1.8	0	16.2
Grasses and legumes in rotation	4.0	1.3	0	8.0	9.5	0	0	4.0
Terracing	2.0	6.1	4.5	2.3	4.2	4.3	1.1	3.3
Grazing land protection	n/a	n/a	n/a	n/a	n/a	1.2	5.6	0.9
Pasture and hay management	n/a	n/a	n/a	n/a	n/a	0	15.6	2.2
Planned grazing system	n/a	n/a	n/a	n/a	n/a	0	7.0	1.1
No-till	32.8	3.2	16.5	13.7	11.3	n/a	n/a	9.0
Other conservation tillage*	9.0	7.7	12.5	8.4	8.1	n/a	n/a	6.6

\*Other conservation tillage category includes ridge, mulch, and other conservation tillage methods.

Irrigation practices	Corn	Cotton	Rice	Soybeans	Wheat	All ag. land
<i>Percent of acres</i>						
Total irrigated area	25.1	34.2	100	35.9	23.5	30.9
Center pivot	7.3	15.9	0	2.8	3.7	5.3
Other sprinkler systems	0	2.2	2.6	0.8	0	0.9
Gravity systems	16.1	14.3	82.3	20.6	13.4	17.7
Other irrigation systems	1.7	1.8	15.0	11.7	6.4	7.0
Fertigation	0	0	0	0	0	0
Chemigation	0	0	0	0	0	0
Source of irrigation scheduling decisions:						
Consultant recommendation	2.2	3.4	1.1	0.6	0	1.2
Computer program	0	1.6	5.7	1.5	3.3	1.6

Land erodibility	Corn	Cotton	Rice	Soybeans	Wheat	Pasture	CRP
% of crop on highly erodible land (HEL)	31	10	0	7	12	58	62
% of crop on HEL in no till	72	11	0	39	29	n/a	n/a
% of crop on HEL in other conservation till	4	10	0	6	33	n/a	n/a
% of crop on HEL in conventional tillage	23	79	0	51	38	n/a	n/a
% of crop on HEL in government program	56	95	0	19	65	n/a	100

Notes: Farmers are required to apply a conservation plan on operated HEL if they wish to be eligible for USDA program benefits. Nineteen percent of all agricultural land in the study area is classified as highly erodible. Erodibility levels are defined by sheet-rill erosion only. None of the area would be classified as HEL due to wind erosion.

Numbers may not add to 100 percent due to rounding or missing data. n/a indicates not applicable.

Source: USDA, ERS, Mississippi Embayment Area Study data.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791.

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, DC 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.



**Agricultural and resource characteristics of the Mississippi Embayment study area, 1993 (cont.)**

<b>Pest and nutrient management practices</b>	<b>Corn</b>	<b>Cotton</b>	<b>Rice</b>	<b>Soybeans</b>	<b>Wheat</b>	<b>All crop land</b>
	<i>Percent of acres</i>					
Type of pest management practice:						
Chemical control methods:						
Herbicides applied	93.8	95.9	82.8	94.9	28.2	85.3
Insecticides applied	5.8	75.0	8.4	5.8	0	28.7
Other pesticides applied	0	87.9	17.2	1.3	4.2	30.7
Biological pest methods	1.0	12.8	0	1.7	1.4	4.5
Cultural control methods:						
Pest resistant varieties	11.2	14.2	32.8	27.3	37.6	22.5
Destroy residues for host-free zone	21.3	55.7	32.6	28.3	23.0	35.1
Rotations	42.7	7.3	50.2	33.2	41.7	27.5
Pest control factor in timing/location	16.2	12.3	23.4	13.6	15.7	14.1
Source of pest management advice:						
On-farm pest specialist	7.7	25.1	5.3	4.6	7.8	10.8
Extension/University/State/Federal	9.9	18.5	23.3	17.0	20.8	17.4
Chemical dealer	16.0	24.2	42.4	21.9	24.1	23.5
Professional scout	10.6	69.2	23.5	12.2	9.2	28.7
Type of nutrient management practice:						
Nitrogen testing (soil or tissue)	36.7	28.6	29.4	7.7	6.9	18.1
Manure usage	0	0	3.8	0.7	0	0.6
Most important factor influencing N use:						
Fertilizer company recommendation	3.0	8.5	14.3	4.2	9.6	6.5
Consultant recommendation	6.6	10.5	15.3	1.5	1.5	5.5
Crop appearance	8.1	22.6	13.1	4.3	11.8	11.5
Soil/tissue test	21.0	21.1	5.0	2.0	5.2	9.7
Extension service	13.0	6.4	17.9	6.3	11.6	8.4
Standard amount for crop/rotation	43.9	18.8	28.5	14.0	54.6	22.2

<b>Nutrient use</b>	<b>Corn</b>	<b>Cotton</b>	<b>Rice</b>	<b>Soybeans</b>	<b>Wheat</b>
Avg. lbs/acre/year on fertilized area:					
Nitrogen	156.6	98.2	166.1	42.1	46.4
Phosphate	51.4	32.5	11.4	28.9	30.1
Potash	65.2	60.2	12.2	39.0	36.5
Percent of crop area fertilized	95.3	97.9	97.5	34.7	31.9

<b>Pesticide use</b>	<b>Corn</b>		<b>Cotton</b>		<b>Soybeans</b>	
	<i>Lbs/ acres</i>	<i>Percent of acres</i>	<i>Lbs/ acres</i>	<i>Percent of acres</i>	<i>Lbs/ acres</i>	<i>Percent of acres</i>
Herbicides:						
Alachlor	1.75	31	*	*	1.75	3
Atrazine	1.23	85	*	*	*	*
Fluometuron	--	--	0.63	89	--	--
Glyphosate	0.72	9	0.51	10	0.56	14
Metolachlor	1.41	41	1.06	10	1.43	6
MSMA	--	--	0.82	48	--	--
Paraquat	0.52	15	0.29	5	0.52	4
Trifluralin	*	*	0.72	45	0.78	31
Insecticides:						
Aldicarb	--	--	0.52	22	--	--
Chlorpyrifos	--	--	0.64	22	*	*
Dicofol	--	--	0.28	20	--	--
Methyl Parathion	--	--	0.37	48	*	*

\* Indicates too few observations for estimation. -- Indicates no use reported.

Percent of acres refers to the percent of total acreage in each crop that received an application of the corresponding pesticide.

Source: USDA, ERS, Mississippi Embayment Area Study data



**Agricultural and resource characteristics of the Mississippi Embayment study area, 1993 (cont.)**

Gross value of farm sales (\$)	Cash grains	Other field crops	Beef, hogs, sheep, dairy & other livestock	CRP only
<i>Percent of farms</i>				
\$0-9,999	3.4	0.7	32.7	61.7
10,000-19,999	2.2	1.0	13.1	19.1
20,000-29,999	0.7	0.2	10.3	10.6
30,000-39,999	2.7	1.7	2.8	6.4
40,000-59,999	3.4	1.7	10.3	0
60,000-99,999	12.3	6.7	11.2	2.1
100,000-249,999	27.6	21.2	9.3	0
250,000-499,999	21.4	22.6	6.5	0
500,000 and up	26.1	44.2	3.7	0
Share of total farms	42.7	41.6	10.8	4.6

Soil leaching potential	Corn	Cotton	Rice	Soybeans	Wheat	Pasture	CRP	All ag. land
<i>Percent of acres</i>								
Very Low	0	1	0	0	1	0	0	0
Low	10	25	49	51	37	22	12	35
Moderate	21	27	23	16	17	18	6	19
High	62	44	28	31	39	50	80	42
Very High	7	3	1	2	7	3	2	3
Unknown	0	1	0	0	0	6	0	1

Note: Twenty-seven percent of highly leachable cropland (high or very high categories) was irrigated.

Soil leaching potential (SLP) = texture component + organic component + pH component

\* Potential of soils to leach highly soluble chemicals, based on intrinsic soil properties. Algorithm developed by J.B. Weber and R.L. Warren, North Carolina State University, in Weber, J.B. and R.L. Warren. "Herbicide Behavior in Soils: A Pesticide/Soil Ranking System for Minimizing Groundwater Contamination." Proceedings of the Northeastern Weed Science Society, Vol. 46, 1992.

May not add to 100 percent due to rounding

Source: USDA, ERS, Mississippi Embayment Area Study data

**Area Studies Project**

The Area Studies project is a data collection and modeling effort which links farm production activities to environmental characteristics for selected regions. The effort involves the Economic Research Service (ERS), the Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), and the National Agricultural Statistics Service (NASS).

The Mississippi Embayment region was one of the 11 areas included in the project. The surveys were conducted over a 3-year period, between 1991 and 1993, and sites were selected from those included in USGS's National Water Quality Assessment Program. Each area chosen for the study had significant cropland and agricultural chemical use. Detailed information on production technologies, cropping systems, and agricultural practices at both the field and whole farm level were collected. The survey sample points were chosen to correspond with National Resource Inventory (NRI) sample points, for which NRCS had collected soil, water, and other natural resource data.

**AREI UPDATES**

Natural Resources and Environment Division  
1301 New York Ave., NW, rm 524  
Washington, DC 20005-4788

FIRST CLASS  
POSTAGE & FEES PAID  
USDA  
PERMIT NO. G-145

Jeffrey A. Mair  
Acquisitions & Serials Branch-Gift & Exchange Progm.  
USDA/Nat. Ag. Library-Serials Unit, Room 002 95654  
Beltsville, MD 20705-2351